



# Mindfulness-based therapy in adults with an autism spectrum disorder: A randomized controlled trial

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## ABSTRACT

Research shows that depression and anxiety disorders are the most common psychiatric concern in autism spectrum disorders (ASD). Mindfulness-based therapy (MBT) has been found effective in reducing anxiety and depression symptoms, however research in autism is limited. Therefore, we examined the effects of a modified MBT protocol (MBT-AS) in high-functioning adults with ASD. 42 participants were randomized into a 9-week MBT-AS training or a wait-list control group. Results showed a significant reduction in depression, anxiety and rumination in the intervention group, as opposed to the control group. Furthermore, positive affect increased in the intervention group, but not in the control group. Concluding, the present study is the first controlled trial to demonstrate that adults with ASD can benefit from MBT-AS.

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## 1. Introduction

Autism is a lifelong developmental disorder that affects an individual's functioning in multiple areas. As people with ASD mature, they often obtain a better understanding of their strengths and weaknesses (Frith & Happé, 1999). However, growing self-awareness and an increasingly complex social world may enhance the risk of developing co-morbid mood and anxiety disorders through lifespan (Tantam, 2003). Depression and anxiety disorders appear to be the most common psychiatric concern in ASD, especially in higher functioning adults and adolescents (Hofvander et al., 2009; Lecavalier, 2006; Rumsey, Rapoport, & Sceery, 1985; Shtayermman, 2007; Skokauskas & Gallagher, 2010). This stresses the need for effective interventions.

Various interventions have been developed to alleviate comorbid symptoms in adults with ASD, however, evidence for their efficacy is limited. Non-medical treatments for comorbid depression and anxiety in ASD have mainly been focused on the application of cognitive behavioral therapy (CBT). With regard to adults with ASD, two  $N = 1$  studies and one  $N = 3$  study described positive effects of CBT on symptoms of depression and anxiety (Cardaciotto & Herbert, 2004; Hare, 1997; Weiss & Lunsy, 2010). However, the researchers also described limitations of CBT for individuals with ASD. Firstly, it generally took a long time for the individuals to grasp the concept of cognitive restructuring. Secondly, it was questionable whether the gains were of a lasting nature. Thirdly, generalization of the cognitive-behavioral techniques to real-life situations appeared to be

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limited. These constraints stress the importance to examine other techniques in the treatment of comorbid depression and anxiety in individuals with ASD.

Mindfulness-based therapy (MBT) constitutes a relatively new form of treatment that has been found particularly effective in treating mood disorders in clinical populations (Hofmann, Sawyer, Witt, & Oh, 2010; Teasdale, Segal, & Williams, 1995). Mindfulness has been defined as paying attention to experiences in the present moment in a nonjudgmental and accepting way (Kabat-Zinn, 1990). These experiences include ones thoughts and feelings, which are accepted as just temporary mental phenomena without the need to analyze their content and change them, such as in CBT. The concept of mindfulness is closely related to the concept of acceptance, which is fundamental in Acceptance and Commitment Therapy (ACT) (Hayes, 2004). These relatively new methods based on mindfulness have also been called the “Third wave of cognitive and behavioral therapies” (Hayes, 2004). It is conceptualized that by teaching people to accept thoughts and feelings as they appear, avoidance strategies can be countered effectively (Hayes, 2004), which reduces ruminative thinking and consequently also anxiety and negative mood (e.g. Jain et al., 2007; Nyklíček & Kuijpers, 2008).

Thus, although both MBT and CBT both aim at reducing symptoms of depression and anxiety, the underlying mechanisms differ. In CBT, thoughts and feelings are identified and analyzed in order to examine whether they are beneficial and realistic (Beck, 1993), whereas, in MBT, analysis of the contents of thoughts and feelings is unnecessary (Kabat-Zinn, 1982). The acceptance without analysis is accomplished mainly by simple experiential exercises during which patients are learned to identify phenomena occurring in the present moment (e.g., bodily sensations, thoughts, feelings) and accept them just as they appear. In light of the deficits in theory of mind and communication of many patients with ASD (Baron-Cohen, Leslie, & Frith, 1985; Tager-Flusberg, Paul, & Lord, 2005), such emphasis on simple experiential exercises without the need to analyze and discuss thoughts seems highly suitable for these individuals.

Research into the effects of MBT in individuals with ASD is limited to three small adolescent studies without control groups. One study examined adolescents with externalizing disorders and their parents (Bögels, Hoogstad, van Dun, de Schutter, & Restifo, 2008). Fourteen adolescents participated, of which four were diagnosed with an autism spectrum disorder, combined with externalizing behavior. Results showed improvements in social interaction, concentration, awareness, impulsive behavior and happiness. Unfortunately, the effects of the ASD subgroup were not investigated separately and there was no randomized control group. The other two studies were conducted by Singh, Lancioni, Manikam, et al. (2011) and Singh, Lancioni, Singh, et al. (2011), in which adolescents with either the autistic disorder or Asperger syndrome received an intervention that was based on mindfulness; their mothers taught them to shift their attention from their emotion (e.g. anger, frustration), to the soles of their feet. Results of these studies showed a decrease in aggression. Despite the promising results, final conclusions about the effectiveness of mindfulness could not be drawn, given the small group sizes with 3 individuals in each group, and considering the narrow focus of the intervention. Finally, the fact that all three studies did not use a control group is an important methodological limitation, and questions the assumption that the intervention itself was responsible for the changes obtained.

Further research is important to examine in more detail whether and how individuals with ASD can benefit from MBT, using a randomized controlled protocol. Therefore, we aim to investigate whether a modified MBT protocol may be beneficial for adults with ASD in treating comorbid affective symptoms, by means of a randomized controlled trial (RCT). This modified protocol will further be named MBT-AS (mindfulness-based-therapy for autism spectrum disorders). We hypothesize that MBT-AS will reduce symptoms of depression and anxiety in these individuals. A relevant variable when examining the effects of mindfulness on symptoms of depression and anxiety is the tendency to ruminate, which has been described as the tendency to think repetitively about the causes, situational factors and consequences of one's emotional experience (Nolen-Hoeksema, 1991). Rumination has been hypothesized to be an important factor in both the etiology and maintenance of depression and anxiety disorders (McLaughlin & Nolen-Hoeksema, 2010; Nolen-Hoeksema, 2000). Furthermore, previous studies showed evidence to suggest that mindfulness may decrease rumination (Borders, Earleywine, & Jajodia, 2010; Burg & Michalak, 2011; Chambers, Chuen Yee Lo, & Allen, 2008; Jain et al., 2007). Thus, rumination may be hypothesized to be a mechanism (partially) responsible for any decrease in symptoms of mood disturbance. Therefore, rumination was also included in our study. It was examined whether and how any improvement in depression and anxiety is related to a decrease in rumination tendencies. We hypothesized (i) a decrease in symptoms of depression and anxiety and of rumination tendencies, as well as an increase in positive affect after the intervention, and (ii) statistical mediation of the changes in affect by a change in rumination.

## 2. Material and methods

### 2.1. Participants and procedure

The participants were recruited from the Adult Autism Center of Eindhoven, The Netherlands. All participants had undergone a standardized diagnostic process. The autism spectrum disorder was diagnosed by means of evaluation of historic and current symptomatology by an experienced and trained psychologist. Parents were interviewed to gather developmental information, using the Dutch version of the Autism Diagnostic Interview, Revised version (ADI-R, Lord, Rutter, & Le Couteur, 1994). When parental information was not available, an older sibling was interviewed. In this manner, additional information about early childhood was gathered. Also, a semi-structured interview was conducted with all participants in order to assess the ASD criteria of the DSM-IV-TR (APA, 2000). For each diagnostic criterion, a standard

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